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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,710	06/23/2003	Shigekazu Nagai	CS-22-030623	5749

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EXAMINER	
KRAUSE, JUSTIN MITCHELL	
ART UNIT	**PAPER NUMBER**
3682	

DATE MAILED: 09/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/600,710	NAGAI ET AL.	
	Examiner	Art Unit	
	Justin Krause	3682	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 June 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *6/23/03* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. There are no information disclosure statements on record and therefore were not considered during examination.

Specification

2. The abstract of the disclosure is objected to because the phrase, "a plurality of teeth circumferentially" is unclear. It appears as if a word is missing. Teeth might be arranged circumferentially about a gear section, or circumferentially placed, but it is not clear how a gear section can have a plurality of teeth circumferentially. There is no arrangement term in there that would provide explanation as to how the teeth are positioned in the device. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

3. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, "substantially in parallel" is indefinite. Objects or bodies may either be arranged in parallel or they are not parallel. It is not possible to have an arrangement where two bodies are substantially parallel.

Also in claim 1, "a gear section having a plurality of teeth circumferentially" is unclear. The meaning of this phrase is not known because it fails to explain clearly how the teeth are arranged on the gear section.

In claims 1 and 4, "outside", the meaning of outside is unclear and lacks antecedent basis with respect to the language of the specification. Examiner believes "outside" to mean --the atmosphere--, as disclosed in the specification.

In claim 5, "said collar members capable of entering holes" lacks antecedent basis. Examiner believes "holes" should read –said holes--. As written, the claim implies the introduction of a second set of holes.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 8 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Klopfenstein (US Patent 4,745,815).

Klopfenstein shows a screw actuator device having a housing body (28), a motor (12) which is parallel to an axis of the housing body and has a gear train (22) which transmits rotary motion from the motor to a feed screw mechanism, which converts said rotary motion into rectilinear motion. The feed screw mechanism comprises a feed screw nut (24), externally fitted to mesh with the gear train (22) and has a gear integrally formed on its exterior cylindrical surface and a feed screw shaft (30) which is driven by the feed screw nut back and forth from the housing body to outside.

The housing body includes cover members connected to both ends (a first cover illustrated by the bold line on the right hand side, and a second cover illustrated by brake member 84 on the left hand side of figure 1). A piston (52) is connected to the ball screw (30) and is slidably displaceable along the inner wall of the housing body.

A first bearing (26) is arranged on a first end of the feed screw nut and a second bearing (28) is arranged on a second end of the feed screw nut for rotatably supporting the feed screw nut. The feed screw nut (24) is also provided with a circumferential gear section formed integral to the feed screw nut as an annular projection that is comprised of one of the gears of the gear train (22).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 3-5, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Klopfenstein in view of Faudi (US Patent 1,973,432).

Klopfenstein discloses claimed subject matter as shown above.

Klopfenstein does not show an actuator having a cushion mechanism with cushion chambers, which are compressed by the piston, and having valves to adjust flow rates of air from the chambers to outside, which absorbs shock exerted on the piston when the piston reaches the limit of displacement.

Faudi teaches a piston assembly for an air hammer having a cushion chamber system. A housing (a) making up the cushion chamber has holes (c and h) to accept a piston (f) and an auxiliary piston (f'). A valve passage (e) connects hole (c) to an outside source of compressed air. The pistons apply force on the compressed air, which resists the force; dampening the recoil, and creating the cushioning effect. The holes also serve as collar members and the engagement of the piston with the hole serves to guide and seal the piston to trap compressed air within the chamber (page 2, line 15 on).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Klopfenstein with Faudi and add a cushion to the piston to dampen the piston movement when the limit of travel is reached. Adding cushion chambers to the piston would reduce vibration and prevent the piston from impacting the cover plates on the end of the housing.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klopfenstein as modified by Faudi as applied to claims 3-5 above, and further in view of Oster (US Patent 3,281,138).

Klopfenstein as modified by Faudi shows claimed subject matter as described above.

Klopfenstein as modified by Faudi does not show an actuator having cushion packings installed in the holes to seal the surrounding outer surfaces of the collar members.

Oster teaches the use of seal rings (81 and 61) serving as cushion packings to seal the chambers of the piston.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Klopfenstein as modified by Faudi with Oster and add cushion packings to the holes of the cylinder. The motivation being prevention of fluid from passing from one chamber to another through the gap between the piston and cylinder wall.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klopfenstein.

Klopfenstein shows the claimed subject matter as described above.

Klopfenstein does not show a gear mechanism having a first gear on the motor shaft engaging a second gear on a parallel axis provided between the first gear and the gear section on the feed screw nut.

It is an inherent feature of the design of a system of gears to select a number of gears and ratios to achieve a desired ratio and torque increase. Klopfenstein shows a gear train comprising 2 gears and is a functional equivalent of the claimed gear set. There is no disclosed reasoning regarding the necessity of 3 gears as opposed to any other number of gears that may be used. Both inventions use electric motors whose direction of rotation may be reversed by reversing the polarity of the motor to provide rotation in the opposite direction and therefore an even number of gears could be used in place on an odd number of gears and still achieve desired function in both directions.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Klopfenstein in view of Scavini (US Patent 3,053,104).

Klopfenstein shows claimed subject matter as described above.

Klopfenstein does not show a piston having a polygonal shaped cross-section that slides along the inner wall of the housing body of the same cross-sectional shape as said piston, preventing the piston from rotating.

Scavini shows a screw and nut device with a guiding piston having a splined cross-section. The piston (13) has splines (14), which follow grooves (15) in the housing walls to prevent the piston from rotating with respect to the housing. A piston having splines about its exterior surface would possess the cross-sectional shape of a many sided polygon.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Klopfenstein and Scavini and restrict rotation of the piston by having a piston of a polygonal cross-sectional shape fitted into a similarly shaped housing. In the original invention of Klopfenstein, the piston is journaled on bearings (64) within the feed screw on one end and fastened to a surface (fastener 56 on surface 54) as a means for preventing rotation. Modifying the piston to not rotate within the housing is functionally equivalent to restricting the rotational motion of the housing with the use of an exterior fastening means.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

2,476,376 shows a motor-driven screw and nut device having a gear train comprising 3 gears

2,769,430 shows a motor-driven screw and nut device having a gear train comprising 3 gears

3,281,138 shows an air piston device having seals and valves

4,089,624 shows a screw driven piston device

2,520,014 shows a screw and nut device with a polygonal shaped piston

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Krause whose telephone number is 571-272-3012. The examiner can normally be reached on Monday - Friday, 7:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on 571-272-7095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMK
9/7/05

DAVID FENSTERMACHER
PRIMARY EXAMINER 9/7/05